

Notice of Allowability

Application No.

09/396,055

Examiner

Charles Chow

Applicant(s)

SARRAF ET AL.

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2685

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 11/22/2004.
2. ☒ The allowed claim(s) is/are 1-30.
3. ☒ The drawings filed on 02 December 2002 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 5/7/2004
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____.
7. ☐ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

Detailed Action***Allowable Subject Matter***

1. The following is an examiner's statement of reasons for allowance:

Claims 1-30 are allowable over the prior art of record, the prior art fails to teach singly, particularly, or in combination, the subject matter, for the communication in OFDM system, having the method and receiver, for receiving a transmitted OFDM frame having the differentially encoded signature sequence with data together in the frequency domain. The signature sequence is located at an expected location such that when receiver decodes the frequency encoded signal, the peak of the signature sequence can be correlated in an expected location, in order to estimate a frequency offset, inter-leaver synchronization, from a single OFDM frame, as shown in independent claims 1, 12, 22, 29-30. The dependent claims are also allowable due to their dependency upon the independent claims.

The closest patent to **Kleider et al. (US 6,487,252 B1)** teaches the receiver 30 for receiving differentially encoded signature pilot sequence 18 and the together encoded digital data input to serial-to-parallel converter 12 in the OFDM system (Fig. 1-4, col. 1, lines 5-9; col. 2, lines 50-64; col. 3, line 46 to col. 4, line 11). However, transmitted signal is encoded in time domain from the inverse FFT of the poly-phase filter 16, for the differential encoding in transmitter 10 (col. 4, lines 8-10), for the corresponding time domain decoding in receiver, in order to improve the synchronization (col. 1, lines 7-9). Kleider fails to teach the differentially encoding in frequency domain.

Tomisato et al. (US 5,504,783) teaches the transmitting modulated data in frequency domain for synchronization, the frequency diversity transmitter 1 (Fig. 1, abstract) for encoding chip

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symbol b_i with four frequencies, f_1 - f_4 in encoder 11, and modulating the data from encoder 11 with different carrier frequencies via frequency controller 14, and then transmitting modulated data information on different carriers to receiver 2 (Fig. 1-2, Fig. 8, Fig. 26; col. 2, line 65 to col. 3, line 2; col. 5, line 65 to col. 7, line 15; col. 8, lines 38-64; col. 15, lines 15-54). Tomisato fails to teach the differentially encoded signature with data together in frequency domain for the estimation of frequency offset, infer-leaver synchronization, at receiver, and Tomisato could not combine the transmitted data in frequency domain to Kleider's receiver operated in time domain.

Other prior arts in below has been considered, but they fail to teach the above claimed features.

Rakib et al. (US 6,307,868 B1) teaches the block interleaver (Fig. 14, 16) for a system for transmitting encoded master carrier and encoded master clock for head end modem transceiver, using orthogonal codes, for periodically adjusting the phase of the master carrier and master clock at central unit, title, abstract, Fig. 1, Fig. 9, Fig. 37), the transmitting Barker code encoded carrier/clock signature sequence in between central unit and remote unit (col. 14, lines 27-20; col. 17, lines 14-20), the centering/fine tuning, synchronizing, the window to Barker code (Fig. 36, 137; col. 18, lines 57-67, col. 42, lines 22-23; and in Fig. 9, Fig. 13, Fig. 14, Fig. 16; col. 10, lines 5-15; col. 40, lines 57-67). Rakib fails to teach the differentially encoded signature with data together in frequency domain for the estimation of frequency offset, infer-leaver synchronization, at receiver.

Van Nee (US 6, 404,732) teaches the very low side-lobe antenna for signature sequence Barker code, having a high level of autocorrelation (col. 1, lines 62-67), the enhanced multi-

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path performance by using the modified orthogonal codes such that the autocorrelation side lobes would be reduced to the possible level during the correlation. The M codes for autocorrelation is the complementary Barker code, signature sequence, received in the orthogonal codes autocorrelation (as shown in abstract, col. 1, lines 62-67; col. 3, lines 40-53; col. 6, lines 16; col. 4, lines 60-66; the complementary Barker code has low side-lobes). Van Nee fails to teach the differentially encoded signature with data together in frequency domain for the estimation of frequency offset, infer-leaver synchronization, at receiver.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Chow whose telephone number is (703)-306-5615.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban, can be reached at (703)-305-4385.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to: (703) 872-9306 (for Technology Center 2600 only)


Hand-delivered responses should be brought to 220 South 20th Street, Crystal Plaza Two, Lobby, Room 1B03, Arlington, VA 22202 (Customer Window).

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Charles Chow *C.C.*

March 3, 2005.


EDWARD F. URBAN
SUPERVISOR/ PATENT
TECHNOLOGY CENTER 2600